

09/975,384

FILE 'HOME' ENTERED AT 16:29:43 ON 14 NOV 2003

=> file biosis medline caplus wpids uspatfull  
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FULL ESTIMATED COST

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FILE 'WPIDS' ENTERED AT 16:30:14 ON 14 NOV 2003  
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FILE 'USPATFULL' ENTERED AT 16:30:14 ON 14 NOV 2003  
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\*\*\* YOU HAVE NEW MAIL \*\*\*

=> s nanoparticle? (7a) oligonucleotide?  
L1 567 NANOPARTICLE? (7A) OLIGONUCLEOTIDE?

=> s l1 and reporter  
L2 236 L1 AND REPORTER

=> s l2 and probe?  
L3 226 L2 AND PROBE?

=> s l3 and hybridaztion  
L4 0 L3 AND HYBRIDAZTION

=> s l3 and hybridization  
L5 223 L3 AND HYBRIDIZATION

=> dup rem l5  
PROCESSING COMPLETED FOR L5  
L6 211 DUP REM L5 (12 DUPLICATES REMOVED)

=> s l6 and oligonucleotide? (5a) reporter  
L7 41 L6 AND OLIGONUCLEOTIDE? (5A) REPORTER

=> s l7 and sequence? (5a) complement?  
L8 41 L7 AND SEQUENCE? (5A) COMPLEMENT?

=> d l8 bib abs 1-41

L8 ANSWER 1 OF 41 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN  
AN 2003-615795 [58] WPIDS  
CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];  
2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17];  
2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22];  
2003-237646 [23]; 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45];  
2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56];  
2003-634854 [60]  
DNN N2003-490341 DNC C2003-167921

TI Detecting nucleic acid having two portions, by providing **nanoparticles** having **oligonucleotides** attached to it, contacting nucleic acid and **nanoparticles** to allow **hybridization**, and observing detectable change.

DC B04 D16 S03

IN ELGHANIAN, R; LETSINGER, R L; MIRKIN, C A; MUCIC, R C; STORHOFF, J J; TATON, T A

PA (NANO-N) NANOSPHERE INC

CYC 1

PI US 2003049630 A1 20030313 (200358)\* 129p

ADT US 2003049630 A1 Provisional US 1996-31809P 19960729, CIP of WO 1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US 1999-344667 19990625, Provisional US 2000-200161P 20000426, Cont of US 2000-603830 20000626, US 2001-957318 20010920

FDT US 2003049630 A1 CIP of US 6361944

PRAI US 2001-957318 20010920; US 1996-31809P 19960729; WO 1997-US12783 19970721; US 1999-240755 19990129; US 1999-344667 19990625; US 2000-200161P 20000426; US 2000-603830 20000626

AN 2003-615795 [58] WPIDS

CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-634854 [60]

AB US2003049630 A UPAB: 20030919

NOVELTY - Detecting (M1) nucleic acid having two portions, involving providing **nanoparticles** having **oligonucleotides** attached to it, which has a **sequence complementary** to a **sequence** of two portions of nucleic acid, contacting nucleic acid and **nanoparticles**, to allow **hybridization** of **oligonucleotides** with two or more portions of nucleic acid, and observing a detectable change brought about by **hybridization**, is new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) a kit comprising a container holding a composition comprising two types of **nanoparticles** having **oligonucleotides** attached to it, where the **oligonucleotides** on the first type of **nanoparticles** have a **sequence complementary** to the **sequence** of a first portion of a nucleic acid, and the **oligonucleotides** on the second type of **nanoparticles** have a **sequence complementary** to the **sequence** of a second portion of the nucleic acid;

(2) an aggregate **probe** comprising at least two types of **nanoparticles** having **oligonucleotides** attached to it, where the **nanoparticles** of the aggregate **probe** are bound to each other as a result of the **hybridization** of some of the oligonucleotides attached to them, and has oligonucleotides attached to it which have a **sequence complementary** to a portion of the **sequence** of a nucleic acid;

(3) a core **probe** comprising at least two types of **nanoparticles** having **oligonucleotides** attached to it, where the **nanoparticles** are bound to each other as a result of **hybridization** of some of the oligonucleotides attached to it;

(4) a substrate having nanoparticles attached to it;

(5) a metallic or semiconductor **nanoparticle** having **oligonucleotides** attached to it, where the **oligonucleotides** are labeled with fluorescent molecules at the ends not attached to the nanoparticle;

(6) a satellite **probe** comprising a particle having oligonucleotides attached to it, and **probe**

**oligonucleotides** hybridized to the **oligonucleotides** attached to the **nanoparticles**, and having a first portion and a second portion, where the first portion has a **sequence complementary** to the **sequence** of the first portion of **oligonucleotides** attached to the particles, and both portions have **sequences complementary** to portions of the **sequence** of the nucleic acid, and the **probe oligonucleotide** further has a **reporter** molecule attached to one end;

(7) a composition comprising at least two types of **nanoparticles** having **oligonucleotides** attached to it;

(8) an assembly of containers comprising first and second containers holding **nanoparticles** having **oligonucleotides** attached to it, which has a **sequence complementary** to that of the **oligonucleotides** attached to the **nanoparticles** in the containers;

(9) a **nanoparticle** (I) having several different **oligonucleotides** attached to it;

(10) binding (M2) **oligonucleotides** to charged **nanoparticles** to produce stable **nanoparticle-oligonucleotide** conjugates;

(11) **nanoparticle-oligonucleotide** conjugates (II) which are **nanoparticles** having **oligonucleotides** attached to them which are present on the surface of the nanoparticles at a surface density sufficient so that the conjugates are stable and having a **sequence complementary** to a portion of the **sequence** of a nucleic acid or another oligonucleotide, and a covalently bound cyclic disulfide or polythiol functional group;

(12) nanomaterials (III) or nanostructures composed of **nanoparticles** having **oligonucleotides** attached to it, where the **nanoparticles** are held together by **oligonucleotide** connectors; and

(13) a kit for detecting an analyte, comprising a container holding (II), and optional support for observing a detectable change.

USE - M1, (I), (II) and the aggregate **probe** are useful for detecting two or more nucleic acids (from a biological source) having at least two portions, such as viral RNA, bacterial or fungal DNA, a gene associated with a disease, synthetic, or structurally-modified natural or synthetic RNA or DNA, or a product of a polymerase chain reaction amplification. (II) is useful for preparing a nanoprobe conjugate for detecting an analyte, and for detecting a nucleic acid bound to an electrode surface. (I) and (II) are useful for nanofabrication, and for separating a selected nucleic acid having two portions from other nucleic acids (all claimed).

ADVANTAGE - Diagnostic assays employing (II) improve the sensitivity of the assay.

Dwg.0/41

L8 ANSWER 2 OF 41 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN  
 AN 2003-596265 [56] WPIDS  
 CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];  
 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17];  
 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22];  
 2003-237646 [23]; 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45];  
 2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-615795 [58];  
 2003-634854 [60]  
 DNC C2003-161361  
 TI Detection of nucleic acid for, e.g. research and analytical laboratories  
 in deoxyribonucleic acid sequencing, involves contacting nucleic acid with  
**nanoparticles** having **oligonucleotides**.  
 DC B04 D16  
 IN ELGHANIAN, R; LETSINGER, R L; MIRKIN, C A; MUCIC, R C; STORHOFF, J J;

09567863

TATON, T A

PA (NANO-N) NANOSPHERE INC

CYC 1

PI US 2002182613 A1 20021205 (200356)\* 107p

ADT US 2002182613 A1 Provisional US 1996-31809P 19960729, CIP of WO 1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US 1999-344667 19990625, Provisional US 2000-200161P 20000426, Cont of US 2000-603830 20000626, US 2001-976971 20011012

FDT US 2002182613 A1 CIP of US 6361944

PRAI US 2001-976971 20011012; US 1996-31809P 19960729; WO 1997-US12783 19970721; US 1999-240755 19990129; US 1999-344667 19990625; US 2000-200161P 20000426; US 2000-603830 20000626

AN 2003-596265 [56] WPIDS

CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-615795 [58]; 2003-634854 [60]

AB US2002182613 A UPAB: 20030919

NOVELTY - Detecting a nucleic acid by contacting nucleic acid with at least two types of **nanoparticles** having **oligonucleotides**, to allow **hybridization** of the **oligonucleotides** on the **nanoparticles**, and observing a detectable change, is new. The **oligonucleotides** on each **nanoparticle** have a **sequence complementary** to its respective portion of the sequence of the nucleic acid.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(1) a kit comprising container(s) holding a composition comprising at least two types of **nanoparticles** having **oligonucleotides**;

(2) an aggregate **probe** comprising at least two types of **nanoparticles** having **oligonucleotides**;

(3) a core **probe** comprising at least two types of **nanoparticles** having **oligonucleotides**;

(4) a satellite **probe** comprising a particle having oligonucleotides, and **probe** oligonucleotides hybridized to the oligonucleotides; and

(5) a method of nanofabrication.

The **probe oligonucleotides** may also have a **reporter** molecule attached to one end.

USE - For the detection of a nucleic acid used in, e.g. research and analytical laboratories in DNA sequencing, in the field to detect the presence of specific pathogens, in the doctor's office for quick identification of an infection to assist in prescribing a drug for treatment, and in homes and health centers for inexpensive first-line screening.

ADVANTAGE - The inventive method of detecting nucleic acids based on observing a color change with the naked eye are cheap, fast, simple, robust (the reagents are stable), do not require specialized or expensive equipment, and little or no instrumentation is required.  
Dwg.0/41

L8 ANSWER 3 OF 41 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN

AN 2003-576420 [54] WPIDS

CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49]; 2003-596264 [56]; 2003-596265 [56]

DNC C2003-155623

TI Detecting nucleic acids having at least 2 portions comprises use of

**nanoparticles** which have **oligonucleotides** attached to them that are complementary to portions of the target nucleic acid sequence.

DC B04 D16  
 IN ELGHANIAN, R; LETSINGER, R L; MIRKIN, C A; MUCIC, R C; STORHOFF, J J; TATON, T A  
 PA (NANO-N) NANOSPHERE INC  
 CYC 1  
 PI US 2003068622 A1 20030410 (200354)\* 130p  
 ADT US 2003068622 A1 Provisional US 1996-31809P 19960729, CIP of WO 1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US 1999-344667 19990625, Provisional US 2000-200161P 20000426, Cont of US 2000-603830 20000626, US 2001-976863 20011012  
 FDT US 2003068622 A1 CIP of US 6361944  
 PRAI US 2001-976863 20011012; US 1996-31809P 19960729; WO 1997-US12783 19970721; US 1999-240755 19990129; US 1999-344667 19990625; US 2000-200161P 20000426; US 2000-603830 20000626  
 AN 2003-576420 [54] WPIDS  
 CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49]; 2003-596264 [56]; 2003-596265 [56]  
 AB US2003068622 A UPAB: 20030906  
 NOVELTY - Detecting nucleic acid (NA) having at least 2 portions comprises providing a type of **nanoparticles** (NP) having **oligonucleotides** (O) attached (where (O) on each NP has a **sequence complementary** to **sequence** of at least two portions of NA), contacting NA and NP to allow **hybridization** of (O) on NP with 2 or more portions of NA, and observing a detectable change brought about by **hybridization** of (O) on NP with NA.  
 DETAILED DESCRIPTION - Detecting (M1) nucleic acid (NA) having at least two portions by providing a type of NP (I) having oligonucleotide (O) attached to it, where (O) on each nanoparticle has a **sequence complementary** to **sequence** of at least two portions of NA, contacting NA and NP to allow **hybridization** of (O) on NP with two or more portions of NA, and observing a detectable change brought about by **hybridization** of the oligonucleotides on the NP with the NA. Detecting NA having at least two portions can optionally be carried out any of the following methods:  
 (a) contacting the NA with at least two types of NP having (O) attached to it ((O) on the first type of NP having a **sequence complementary** to a first portion of the sequence of the NA, the (O) on the second type of NP having a **sequence complementary** to a second portion of the sequence of the NA, the contacting taking place to allow **hybridization** of the (O) on the NP with the NA), and observing a detectable change brought about by **hybridization** of (O) on NP with the NA;  
 (b) providing a substrate having a first type of NP attached to it (the NP having attached to (O), the (O) having a **sequence complementary** to a first portion of the sequence of a NA to be detected), contacting the NA with the NP attached to the substrate under conditions effective to allow **hybridization** of the (O) on the NP with the NA, providing a second type of NP having attached oligonucleotides ((O) having a **sequence complementary** to one or more other portions of the sequence of the NA), contacting the NA bound to the substrate with the second type of NP to allow **hybridization** of the (O) on the second type of NP with the NA and observing a detectable change;  
 (c) contacting a NA to be detected with a substrate having (O) attached to it, the (O) having a **sequence complementary** to a first portion of the sequence of the NA, the contacting taking place

to allow **hybridization** of the (O) on the substrate with the NA, contacting the NA bound to the substrate with a first type of NP having one or more types of (O) attached to it, at least one of the types of oligonucleotides having a **sequence complementary** to a second portion of the sequence of the NA, the contacting taking place to allow **hybridization** of the (O) on the NP with the NA, contacting the first type of NP bound to the substrate with a second type of NP having (O) attached to it, the (O) on the second type of NP having a **sequence complementary** to at least a portion of the sequence of one of the type of (O) on the first type of NP, the contacting taking place to allow **hybridization** of the (O) on the first and second types of NP, and observing a detectable change.

INDEPENDENT CLAIMS are also included for:

- (1) an aggregate **probe** comprising at least two types of NP having attached to it, where NP are bound to each other as a result of **hybridization** of some of (O) attached to it, which have:
  - (a) the **sequence complementary** to a portion of a NA; or
  - (b) a hydrophobic group attached to the end not attached to the NP;
- (2) a core **probe** comprising at least two types of NP having (O) attached to it, the NP of the core **probe** being bound to each other as a result of the **hybridization** of some of the (O) attached to them;
- (3) a substrate having NP attached to it;
- (4) a metallic or semiconductor NP having (O) attached to it, where (O) is labeled with fluorescent molecules at the ends not attached to NP;
- (5) kits and compositions comprising the NP;
- (6) nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles;
- (7) a satellite **probe**;
- (8) an assembly of containers comprising first and second containers having attached (O), and (O) attached to NP having a **sequence complementary** to (O) attached to NP, in the containers;
- (9) a NP (I) having several different attached (O);
- (10) separating a selected NA having at least two portions from other NAs using two or more types of NPs having attached (O);
- (11) methods of synthesizing unique NP-(O) conjugates; NP-(O) conjugate produced by the methods; Methods of using the conjugates for detecting NA having at least two portions;
- (12) NP having oligonucleotides attached to them, the oligonucleotides comprising at least one type of recognition oligonucleotides, each of the recognition oligonucleotides comprising a spacer portion and a recognition portion, the spacer portion being designed so that it is bound to the NP, the recognition portion having a **sequence complementary** to at least on portion of the sequence of a nucleic acid or another oligonucleotide;
- (13) NP having oligonucleotides attached to them, the oligonucleotides comprising: at least one type of recognition oligonucleotides, each of the types or recognition oligonucleotides comprising a **sequence complementary** to at least one portion of the sequence of a nucleic acid or another oligonucleotide; and a type of diluent oligonucleotides; and
- (14) a kit comprising a container holding NP-(O) conjugates and NP as described above.

USE - (I) is useful for separating a selected nucleic acid having at least two portions, from other nucleic acids, and for detecting nucleic acids having at least two portions. The NP-(O) conjugates are useful for detecting NA having at least two portions. (M1) is useful for detecting nucleic acid having at least two portions (claimed).

(M1) is useful for detecting any type of nucleic acids which may be used for diagnosis of disease and in sequencing of nucleic acids. Preferably, the method is useful for detecting nucleic acids for diagnosis

and/or monitoring of viral diseases (human immunodeficiency virus, hepatitis virus, herpes virus, cytomegalovirus and Epstein-Barr virus), bacterial diseases, sexually transmitted diseases, inherited disorders, in forensics, in DNA sequencing, for paternity testing, for cell line authentication, for monitoring gene therapy, etc. The method is useful in research and analytical laboratories in DNA sequencing, in the field to detect the presence of specific pathogens, etc.

ADVANTAGE - Detecting nucleic acids based on observing a color change with the naked eye is cheap, fast, simple and robust, and do not require specialized expensive equipment.

Dwg.0/41

L8 ANSWER 4 OF 41 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN  
 AN 2003-247253 [24] WPIDS  
 CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58]; 2003-634854 [60]  
 DNC C2003-063609  
 TI Detecting nucleic acid having two portions, by providing **nanoparticles** having **oligonucleotides** attached to it, contacting nucleic acid and **nanoparticles** to allow **hybridization**, and observing detectable change, useful in forensics.  
 DC B04 D16  
 IN ELGHANIAN, R; LETSINGER, R L; MIRKIN, C A; MUCIC, R C; STORHOFF, J J; TATON, T A  
 PA (NANO-N) NANOSPHERE INC  
 CYC 1  
 PI US 2002164605 A1 20021107 (200324)\* 130p  
 ADT US 2002164605 A1 Provisional US 1996-31809P 19960729, CIP of WO 1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US 1999-344667 19990625, Provisional US 2000-200161P 20000426, Cont of US 2000-603830 20000626, US 2001-966312 20010928  
 FDT US 2002164605 A1 CIP of US 6361944  
 PRAI US 2001-966312 20010928; US 1996-31809P 19960729; WO 1997-US12783 19970721; US 1999-240755 19990129; US 1999-344667 19990625; US 2000-200161P 20000426; US 2000-603830 20000626  
 AN 2003-247253 [24] WPIDS  
 CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58]; 2003-634854 [60]  
 AB US2002164605 A UPAB: 20030919  
 NOVELTY - Detecting (M1) nucleic acid having two portions, involves providing **nanoparticles** having **oligonucleotides** attached to it, which has a **sequence complementary** to **sequence** of two portions of nucleic acid, contacting nucleic acid and **nanoparticles**, to allow **hybridization** of **oligonucleotides** with two or more portions of nucleic acid, and observing a detectable change brought about by **hybridization**.  
 DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:  
 (1) a kit comprising a container holding a composition comprising two types of **nanoparticles** having **oligonucleotides** attached to it, where the **oligonucleotides** on the first type of **nanoparticles** has a **sequence complementary** to the **sequence** of a first portion of a nucleic acid, and the

**oligonucleotides** on the second type of **nanoparticles** has a **sequence complementary** to the **sequence** of a second portion of the nucleic acid;

(2) an aggregate **probe** comprising at least two types of **nanoparticles** having **oligonucleotides** attached to it, where the **nanoparticles** of the aggregate **probe** is bound to each other as a result of the **hybridization** of some of the oligonucleotides attached to them, and has oligonucleotides having attached to it which have a **sequence complementary** to a portion of the **sequence** of a nucleic acid;

(3) a core **probe** comprising at least two types of **nanoparticles** having **oligonucleotides** attached to it, where the **nanoparticles** is bound to each other as a result of **hybridization** of some of the oligonucleotides attached to it;

(4) a substrate having **nanoparticles** attached to it;

(5) a metallic or semiconductor **nanoparticle** having **oligonucleotides** attached to it, where the **oligonucleotides** are labeled with fluorescent molecules at the ends not attached to the nanoparticle;

(6) a satellite **probe** comprising a particle having oligonucleotides attached to it, and **probe oligonucleotides** hybridized to the **oligonucleotides** attached to the **nanoparticles**, and having a first portion and a second portion, where the first portion has a **sequence complementary** to the **sequence** of the first portion of oligonucleotides attached to the particles, and both portions have **sequences complementary** to portions of the **sequence** of the nucleic acid, and the **probe oligonucleotide** further has a **reporter** molecule attached to one end;

(7) a composition comprising at least two types of **nanoparticles** having **oligonucleotides** attached to it;

(8) an assembly of containers comprising a first and second containers holding **nanoparticles** having **oligonucleotides** attached to it, which has a **sequence complementary** to that of the **oligonucleotides** attached to the **nanoparticles** in the containers;

(9) a **nanoparticle** (I) having several different **oligonucleotides** attached to it which comprises recognition oligonucleotides, each comprising a spacer portion designed so that it is bound to the nanoparticle, and a recognition portion having a **sequence complementary** to a portion of the **sequence** of the nucleic acid or another oligonucleotide, and optionally a type of diluent oligonucleotides;

(10) binding (M2) **oligonucleotides** to charged **nanoparticles** to produce stable **nanoparticle-oligonucleotide** conjugates;

(11) **nanoparticle-oligonucleotide** conjugates (II) which are **nanoparticles** having **oligonucleotides** attached to them which is present on the surface of the nanoparticles at a surface density sufficient so that the conjugates are stable and having a **sequence complementary** to a portion of the **sequence** of a nucleic acid or another oligonucleotide;

(12) nanomaterials (III) or nanostructures composed of **nanoparticles** having **oligonucleotides** attached to it, where the **nanoparticles** are held together by **oligonucleotide** connectors; and

(13) a kit comprising a container holding (I), (II), or the above mentioned substrate.

USE - (M1), (I), (II) and the aggregate **probe** are useful for detecting two or more nucleic acids (from a biological source) having at least two portions, such as viral RNA or DNA, bacterial or fungal DNA,



a gene associated with a disease, synthetic, or structurally-modified natural or synthetic RNA or DNA, or a product of a polymerase chain reaction amplification. (I) and (II) are useful for nanofabrication, and for separating a selected nucleic acid having two portions from other nucleic acids (all claimed). (M1) is useful in forensics, DNA sequencing, for paternity testing, cell line authentication, and monitoring gene therapy.

ADVANTAGE - Diagnostic assays employing (II) improve the sensitivity of the assay.

Dwg.0/41

L8 ANSWER 5 OF 41 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN  
 AN 2003-198491 [19] WPIDS  
 CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];  
 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17];  
 2003-182627 [18]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23];  
 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49];  
 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];  
 2003-634854 [60]  
 DNC C2003-050804  
 TI Detecting nucleic acids having at least 2 portions comprises use of  
**nanoparticles** which have **oligonucleotides** attached to  
 them that are complementary to portions of the nucleic acid sequence.  
 DC B04 D16  
 IN ELGHANIAN, R; LETSINGER, R L; MIRKIN, C A; MUCIC, R C; STORHOFF, J J;  
 TATON, T A  
 PA (NANO-N) NANOSPHERE INC  
 CYC 1  
 PI US 2002155462 A1 20021024 (200319)\* 130p  
 ADT US 2002155462 A1 Provisional US 1996-31809P 19960729, CIP of WO  
 1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US  
 1999-344667 19990625, Provisional US 2000-200161P 20000426, Cont of US  
 2000-603830 20000626, US 2001-976577 20011012  
 FDT US 2002155462 A1 CIP of US 6361944  
 PRAI US 2001-976577 20011012; US 1996-31809P 19960729; WO 1997-US12783  
 19970721; US 1999-240755 19990129; US 1999-344667 19990625; US  
 2000-200161P 20000426; US 2000-603830 20000626  
 AN 2003-198491 [19] WPIDS  
 CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];  
 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17];  
 2003-182627 [18]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23];  
 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49];  
 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];  
 2003-634854 [60]  
 AB US2002155462 A UPAB: 20030919  
 NOVELTY - Detecting nucleic acid (NA) having at least 2 portions comprises  
 providing type of **nanoparticles** (NP) having attached to  
**oligonucleotides** (O) ((O) on each NP has a **sequence**  
**complementary** to **sequence** of at least 2 portions of NA),  
 contacting NA and NP to allow **hybridization** of (O) on NP with 2  
 or more portions of NA, and observing a detectable change brought about by  
**hybridization** of (O) on NP with NA.  
 DETAILED DESCRIPTION - Detecting (M1) nucleic acid (NA) having at  
 least 2 portions by providing a type of NP (I) having  
**oligonucleotide** (O) attached to it ((O) on each  
**nanoparticle** has a **sequence complementary** to  
**sequence** of at least 2 portions of NA), contacting NA and NP to  
 allow **hybridization** of (O) on NP with 2 or more portions of NA,  
 and observing a detectable change brought about by **hybridization**  
 of the oligonucleotides on the NP with the NA.  
 INDEPENDENT CLAIMS are included for the following:  
 (1) an aggregate **probe** comprising at least 2 types of NP

having attached to it, where NP are bound to each other as a result of **hybridization** of some of (O) attached to it, which have:

- (a) the **sequence complementary** to a portion of a NA; or
- (b) a hydrophobic group attached to the end not attached to the NP;
- (2) a core **probe** comprising at least 2 types of NP having (O) attached to it, the NP of the core **probe** being bound to each other as a result of the **hybridization** of some of the (O) attached to them;
- (3) a substrate having NP attached to it;
- (4) a metallic or semiconductor NP having (O) attached to it, where (O) is labeled with fluorescent molecules at the ends not attached to NP;
- (5) kits and compositions comprising the NP;
- (6) nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication using utilizing nanoparticles;
- (7) a satellite **probe** comprising , a particle having attached oligonucleotides, the oligonucleotides having a first portion and a second portion, both portions having **sequences complementary** to portions of the **sequence** of a nucleic acid, and **probe oligonucleotide** hybridized to the **oligonucleotides** attached to the **nanoparticles**, the **probe oligonucleotides** having a first portion and a second portion, the first portion having a **sequence complementary** to the **sequence** of the first portion of the oligonucleotides attached to the particles, both portions having **sequences complementary** to portions of the **sequence** of the nucleic acid, the **probe oligonucleotides** further having a **reporter** molecule attached to one end;
- (8) an assembly of containers comprising first and second containers having attached (O), and (O) attached to NP having a **sequence complementary** to (O) attached to NP, in the containers;
- (9) a NP (I) having several different attached (O);
- (10) separating a selected NA having at least 2 portions from other NAs using 2 or more types of NPs having attached (O);
- (11) methods of synthesizing unique NP-(O) conjugates;
- (12) NP-(O) conjugate produced by the methods;
- (13) methods of using the conjugates for detecting NA having at least 2 portions;
- (14) NP having oligonucleotides attached to them, the oligonucleotides comprising at least one type of recognition oligonucleotides, each of the recognition oligonucleotides comprising a spacer portion and a recognition portion, the spacer portion being designed so that it is bound to the NP, the recognition portion having a **sequence complementary** to at least one portion of the sequence of a nucleic acid or another oligonucleotide;
- (15) NP having oligonucleotides attached to them, the oligonucleotides comprising:
  - (a) at least one type of recognition oligonucleotides, each of the types or recognition oligonucleotides comprising a **sequence complementary** to at least one portion of the sequence of a nucleic acid or another oligonucleotide; and
  - (b) a type of diluent oligonucleotides; and
- (16) a kit comprising a container holding NP-(O) conjugates and NP as described above.

USE - (I) is useful for separating a selected nucleic acid having at least 2 portions, from other nucleic acids, and for detecting nucleic acids having at least 2 portions. The MP-(O) conjugates are useful for detecting NA having at least 2 portions. (M1) is useful for detecting nucleic acid having at least 2 portions (claimed). (M1) is useful for detecting any type of nucleic acids which may be used for diagnosis of disease and in sequencing of nucleic acids. Preferably, the method is

useful for detecting nucleic acids for diagnosis and/or monitoring of viral diseases (human immunodeficiency virus, hepatitis virus, herpes virus, cytomegalovirus and Epstein-Barr virus), bacterial diseases, sexually transmitted diseases, inherited disorders, in forensics, in DNA sequencing, for paternity testing, for cell line authentication, for monitoring gene therapy, etc. The method is useful in research and analytical laboratories in DNA sequencing, in the field to detect the presence of specific pathogens, etc.

ADVANTAGE - Detecting nucleic acids based on observing a color change with the naked eye is cheap, fast, simple and robust, and do not require specialized expensive equipment.

DESCRIPTION OF DRAWING(S) - The figure shows schematic diagram illustrating formation of **nanoparticle** aggregates by combining **nanoparticles** having complementary **oligonucleotides** attached to them, the **nanoparticles** being held together in aggregates has result of the **hybridization** of the complementary oligonucleotides.

Dwg.1/41

L8 ANSWER 6 OF 41 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN  
 AN 2003-182627 [18] WPIDS  
 CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];  
 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17];  
 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23];  
 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49];  
 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];  
 2003-634854 [60]  
 DNC C2003-048104  
 TI Detecting nucleic acids having at least two portions involves use of  
**nanoparticles** which have **oligonucleotides** attached to  
 them that are complementary to portions of the nucleic acid sequence.  
 DC B04 D16  
 IN ELGHANIAN, R; LETSINGER, R L; MIRKIN, C A; MUCIC, R C; STORHOFF, J J;  
 TATON, T A  
 PA (NANO-N) NANOSPHERE INC  
 CYC 1  
 PI US 2002155458 A1 20021024 (200318)\* 130p  
 ADT US 2002155458 A1 Provisional US 1996-31809P 19960729, CIP of WO  
 1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US  
 1999-344667 19990625, Provisional US 2000-200161P 20000426, Cont of US  
 2000-603830 20000626, US 2001-967409 20010928  
 FDT US 2002155458 A1 CIP of US 6361944  
 PRAI US 2001-967409 20010928; US 1996-31809P 19960729; WO 1997-US12783  
 19970721; US 1999-240755 19990129; US 1999-344667 19990625; US  
 2000-200161P 20000426; US 2000-603830 20000626  
 AN 2003-182627 [18] WPIDS  
 CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];  
 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-174167 [17];  
 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23];  
 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49];  
 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];  
 2003-634854 [60]  
 AB US2002155458 A UPAB: 20030919  
 NOVELTY - Detecting (M1) nucleic acid (NA) having at least two portions  
 involves providing type of **nanoparticles** (NP) attached to  
**oligonucleotides** (O), where (O) on each NP has a **sequence**  
**complementary** to **sequence** of at least two portions of  
 NA, contacting NA and NP to allow **hybridization** of (O) on NP  
 with two or more portions of NA, and observing a detectable change brought  
 about by **hybridization** of (O) on NP with NA.  
 DETAILED DESCRIPTION - Detecting (M1) NA having at least two portions  
 can optionally be carried out any of the following methods:

(a) contacting the NA with at least two types of NP having (O) attached to it, (O) on the first type of NP having a **sequence complementary** to a first portion of the sequence of the NA, the (O) on the second type of NP having a **sequence complementary** to a second portion of the sequence of the NA, the contacting taking place to allow **hybridization** of the (O) on the NP with the NA, and observing a detectable change brought about by **hybridization** of (O) on NP with the NA;

(b) providing a substrate having a first type of NP attached to it, the NP having attached to (O), the (O) having a **sequence complementary** to a first portion of the sequence of a NA to be detected, contacting the NA with the NP attached to the substrate under conditions effective to allow **hybridization** of the (O) on the NP with the NA, providing a second type of NP having attached oligonucleotides, (O) having a **sequence complementary** to one or more other portions of the sequence of the NA, contacting the NA bound to the substrate with the second type of NP to allow **hybridization** of the (O) on the second type of NP with the NA and observing a detectable change. Optionally, before carrying the detecting step, the method involves providing a binding oligonucleotide having a selected sequence having at least two portions, the first portion being complementary to at least a portion of the sequence of the (O) on the second type of NP, contacting the binding oligonucleotide with the second type of NP bound to the substrate to allow **hybridization** of the binding oligonucleotide to the (O) on the NP, providing a third type of NP having attached (O), the (O) having a **sequence complementary** to the **sequence** of a second portion of the binding oligonucleotide, contacting the third type of nanoparticle with the binding oligonucleotide bound to the substrate to allow **hybridization** of the NP; and

(c) contacting a NA to be detected with a substrate having (O) attached to it, the (O) having a **sequence complementary** to a first portion of the sequence of the NA, the contacting taking place to allow **hybridization** of the (O) on the substrate with the NA, contacting the NA bound to the substrate with a first type of NP having one or more types of (O) attached to it, at least one of the types of oligonucleotides having a **sequence complementary** to a second portion of the sequence of the NA, the contacting taking place to allow **hybridization** of the (O) on the NP with the NA, contacting the first type of NP bound to the substrate with a second type of NP having (O) attached to it, the (O) on the second type of NP having a **sequence complementary** to at least a portion of the sequence of one of the type of (O) on the first type of NP, the contacting taking place to allow **hybridization** of the (O) on the first and second types of NP, and observing a detectable change.

INDEPENDENT CLAIMS are included for the following:

(1) an aggregate **probe** comprising at least two types of NP having attached to it, where NP are bound to each other as a result of **hybridization** of some of (O) attached to it, which have the **sequence complementary** to a portion of a NA or a hydrophobic group attached to the end not attached to the NP;

(2) a core **probe** comprising at least two types of NP having (O) attached to it, the NP of the core **probe** being bound to each other as a result of the **hybridization** of some of the (O) attached to them;

(3) a substrate having NP attached to it;

(4) a metallic or semiconductor NP having (O) attached to it, where (O) is labeled with fluorescent molecules at the ends not attached to NP;

(5) kits and compositions comprising the NP;

(6) nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication using utilizing nanoparticles;

(7) a satellite **probe** comprising a particle having attached

oligonucleotides;

(8) an assembly of containers comprising first and second containers having attached (O), and (O) attached to NP having a **sequence complementary** to (O) attached to NP, in the containers;

(9) a NP (I) having several different attached (O);

(10) separating a selected NA having at least two portions from other NAs using two or more types of NPs having attached (O);

(11) methods of synthesizing unique NP-(O) conjugates; NP-(O) conjugate produced by the methods;

(12) methods of using the conjugates for detecting NA having at least two portions;

(13) NP having oligonucleotides attached to them;

(14) a kit comprising a container holding NP-(O) conjugates and NP as described above.

USE - (I) is useful for separating a selected nucleic acid having at least two portions, from other nucleic acids, and for detecting nucleic acids having at least two portions. The NP-(O) conjugates are useful for detecting NA having at least two portions. (M1) is useful for detecting nucleic acid having at least two portions (claimed). (M1) is useful for detecting any type of nucleic acids which may be used for diagnosis of disease and in sequencing of nucleic acids. Preferably, the method is useful for detecting nucleic acids for diagnosis and/or monitoring of viral diseases (human immunodeficiency virus, hepatitis virus, herpes virus, cytomegalovirus and Epstein-Barr virus), bacterial diseases, sexually transmitted diseases, inherited disorders, in forensics, in DNA sequencing, for paternity testing, for cell line authentication, and for monitoring gene therapy. The method is useful in research and analytical laboratories in DNA sequencing, in the field to detect the presence of specific pathogens.

ADVANTAGE - Detecting nucleic acids based on observing a color change with the naked eye is cheap, fast, simple and robust, and does not require specialized expensive equipment.

DESCRIPTION OF DRAWING(S) - The figure shows schematic diagram illustrating formation of **nanoparticle** aggregates by combining **nanoparticles** having complementary **oligonucleotides** attached to them, the **nanoparticles** being held together in aggregates has result of the **hybridization** of the complementary oligonucleotides.

Dwg.1/41

L8 ANSWER 7 OF 41 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN  
 AN 2003-174167 [17] WPIDS  
 CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];  
 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-182627 [18];  
 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23];  
 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49];  
 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];  
 2003-634854 [60]  
 DNC C2003-045481  
 TI Detecting nucleic acid having two portions, by providing  
**nanoparticles** having **oligonucleotides** attached to it,  
 contacting nucleic acid and **nanoparticles** to allow  
**hybridization**, and observing detectable change.  
 DC B04 D16  
 IN ELGHANIAN, R; LETSINGER, R L; MIRKIN, C A; MUCIC, R C; STORHOFF, J J;  
 TATON, T A  
 PA (NANO-N) NANOSPHERE INC  
 CYC 1  
 PI US 2002146720 A1 20021010 (200317)\* 132p  
 US 6582921 B2 20030624 (200343)  
 ADT US 2002146720 A1 Provisional US 1996-31809P 19960729, CIP of WO  
 1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US

1999-344667 19990625, Provisional US 2000-200161P 20000426, Cont of US 2000-603830 20000626, US 2001-961949 20010920; US 6582921 B2 Provisional US 1996-31809P 19960729, CIP of WO 1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US 1999-344667 19990625, Provisional US 2000-200161P 20000426, Cont of US 2000-603830 20000626, US 2001-961949 20010920

FDT US 2002146720 A1 CIP of US 6361944; US 6582921 B2 CIP of US 6361944  
 PRAI US 2001-961949 20010920; US 1996-31809P 19960729; WO 1997-US12783 19970721; US 1999-240755 19990129; US 1999-344667 19990625; US 2000-200161P 20000426; US 2000-603830 20000626

AN 2003-174167 [17] WPIDS

CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75]; 2002-258024 [30]; 2002-608256 [65]; 2003-092900 [08]; 2003-182627 [18]; 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23]; 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49]; 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58]; 2003-634854 [60]

AB US2002146720 A UPAB: 20030919

NOVELTY - Detecting (M1) nucleic acid having two portions, comprising providing **nanoparticles** having **oligonucleotides** attached to it, which has a **sequence complementary** to **sequence** of two portions of nucleic acid, contacting nucleic acid and **nanoparticles**, to allow **hybridization** of **oligonucleotides** with portions of nucleic acid, and observing a detectable change brought about by **hybridization**, is new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) an aggregate **probe** comprising at least two types of **nanoparticles** having **oligonucleotides** attached to it, where the **nanoparticles** of the aggregate **probe** is bound to each other as a result of the **hybridization** of some of the **oligonucleotides** attached to them, and has **oligonucleotides** having attached to it which have a **sequence complementary** to a portion of the **sequence** of a nucleic acid;

(2) a core **probe** comprising at least two types of **nanoparticles** having **oligonucleotides** attached to it, where the **nanoparticles** is bound to each other as a result of **hybridization** of some of the **oligonucleotides** attached to it;

(3) a kit comprising a container holding a composition comprising two types of **nanoparticles** having **oligonucleotides** attached to it, where the **oligonucleotides** on the first type of **nanoparticles** has a **sequence complementary** to the **sequence** of a first portion of a nucleic acid, and the **oligonucleotides** on the second type of **nanoparticles** has a **sequence complementary** to the **sequence** of a second portion of the nucleic acid, and also comprising the core **probe**;

(4) a substrate having **nanoparticles** attached to it;

(5) a metallic or semiconductor **nanoparticle** having **oligonucleotides** attached to it, where the **oligonucleotides** are labeled with fluorescent molecules at the ends not attached to the **nanoparticle**;

(6) a satellite **probe** comprising a particle having **oligonucleotides** attached to it, and **probe** **oligonucleotides** hybridized to the **oligonucleotides** attached to the **nanoparticles**, and having a first portion and a second portion, where the first portion has a **sequence complementary** to the **sequence** of the first portion of **oligonucleotides** attached to the particles, and both portions has **sequences complementary** to portions of the **sequence** of the nucleic acid, and the **probe** **oligonucleotide** further has a **reporter** molecule attached

to one end;

(7) a composition comprising at least two types of **nanoparticles** having **oligonucleotides** attached to it;

(8) an assembly of containers comprising a first and second containers holding **nanoparticles** having **oligonucleotides** attached to it, which has a **sequence complementary** to that of the **oligonucleotides** attached to the **nanoparticles** in the containers;

(9) a **nanoparticle** (I) having several different **oligonucleotides** attached to it which comprises recognition oligonucleotides, each comprising a spacer portion designed so that it is bound to the nanoparticle, and a recognition portion having a **sequence complementary** to a portion of the **sequence** of the nucleic acid or another oligonucleotide, and optionally a type of diluent oligonucleotides;

(10) binding (M2) **oligonucleotides** to charged **nanoparticles** to produce stable **nanoparticle-oligonucleotide** conjugates;

(11) **nanoparticle-oligonucleotide** conjugates (II) which are **nanoparticles** having **oligonucleotides** attached to them which is present on the surface of the nanoparticles at a surface density sufficient so that the conjugates are stable and having a **sequence complementary** to a portion of the **sequence** of a nucleic acid or another oligonucleotide, and a covalently bound cyclic disulfide or polythiol functional group;

(12) oligonucleotides having a covalently bound cyclic disulfide or polythiol functional group that can bind to the nanoparticles;

(13) a nanoparticle conjugate for detecting an analyte, comprising **nanoparticles** having **oligonucleotides** bound to it, and **oligonucleotide** having bound to it a specific binding complement of an analyte having a **sequence** that is **complementary** to a portion of the **oligonucleotides** bound to the **nanoparticles** and are bound, as a result of **hybridization**, and a linker oligonucleotide having two portions;

(14) nonmaterials (III) or nanostructures composed of **nanoparticles** having **oligonucleotides** attached to it, where the **nanoparticles** are held together by **oligonucleotide** connectors;

(15) a kit for detecting an analyte, comprising a container holding (II), and optional support for observing a detectable change; and

(16) a nanomaterial produced, by providing linking **oligonucleotide** comprising two portions, two types of **nanoparticles** having **oligonucleotides** attached to it, and a complex comprised of streptavidin or avidin bound to two or more biotin molecules, each having an oligonucleotide bound to the biotin molecule, which has a **sequence** that is **complementary** to the second portion of the linking oligonucleotide, and contacting the first and second types of **nanoparticles**, the linking **oligonucleotides** and the complex, to allow **hybridization** of the **oligonucleotides** on the **nanoparticles** to each other and to the linking **oligonucleotide** and the **hybridization** of the oligonucleotide of the complexes to the linking oligonucleotides so that a desired nanomaterials or nanostructures is formed.

USE - M1, (I), (II) and the aggregate **probe** are useful for detecting two or more nucleic acids (from a biological source) having at least two portions, such as viral RNA, bacterial or fungal DNA, a gene associated with a disease, synthetic, or structurally-modified natural or synthetic RNA or DNA, or a product of a polymerase chain reaction amplification. (II) is useful for preparing a nanoprobe conjugate for detecting an analyte, and for detecting a nucleic acid bound to an electrode surface. (I) and (II) are useful for fabrication, and for

separating a selected nucleic acid having two portions from other nucleic acids. (I), (II) and the aggregate **probe** are useful for detecting an analyte (especially polyvalent analyte) in a sample. (All claimed.)

ADVANTAGE - Diagnostic assays employing (II) improve the sensitivity of the assay.

Dwg.0/41

L8 ANSWER 8 OF 41 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN  
 AN 2002-608256 [65] WPIDS  
 CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];  
 2002-258024 [30]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18];  
 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23];  
 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49];  
 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];  
 2003-634854 [60]  
 DNC C2002-171859  
 TI Detecting nucleic acid having two portions, by providing  
**nanoparticles** having **oligonucleotides** attached to it,  
 contacting nucleic acid and **nanoparticles** to allow  
**hybridization**, and observing detectable change.  
 DC B04 D16  
 IN ELGHANIAN, R; GARIMELLA, V; LETSINGER, R L; LI, Z; MIRKIN, C A; MUCIC, R  
 C; PARK, S; STORHOFF, J J; TATON, T A  
 PA (NANO-N) NANOSPHERE INC; (ELGH-I) ELGHANIAN R; (GARI-I) GARIMELLA V;  
 (LETS-I) LETSINGER R L; (LIZZ-I) LI Z; (MIRK-I) MIRKIN C A; (MUCI-I) MUCIC  
 R C; (PARK-I) PARK S; (STOR-I) STORHOFF J J; (TATO-I) TATON T A  
 CYC 98  
 PI WO 2002046472 A2 20020613 (200265)\* EN 442p  
 RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ  
 NL OA PT SD SE SL SZ TR TZ UG ZM ZW  
 W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK  
 DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR  
 KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO  
 RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW  
 AU 2002030593 A 20020618 (200266)  
 US 2002172953 A1 20021121 (200279)  
 ADT WO 2002046472 A2 WO 2001-US46418 20011207; AU 2002030593 A AU 2002-30593  
 20011207; US 2002172953 A1 Provisional US 1996-31809P 19960729, CIP of WO  
 1997-US12783 19970721, CIP of US 1999-240755 19990129, CIP of US  
 1999-344667 19990625, Provisional US 2000-176409P 20000113, Provisional US  
 2000-192699P 20000328, Provisional US 2000-200161P 20000426, CIP of US  
 2000-603830 20000626, Provisional US 2000-224631P 20000811, Provisional US  
 2000-254392P 20001208, Provisional US 2000-255235P 20001211, CIP of US  
 2001-760500 20010112, CIP of US 2001-820279 20010328, US 2001-927777  
 20010810  
 FDT AU 2002030593 A Based on WO 2002046472; US 2002172953 A1 CIP of US 6361944  
 PRAI US 2001-927777 20010810; US 2000-254392P 20001208; US 2000-254418P  
 20001208; US 2000-255235P 20001211; US 2000-255236P 20001211; US  
 2001-760500 20010112; US 2001-820279 20010328; US 2001-282640P  
 20010409; US 1996-31809P 19960729; WO 1997-US12783 19970721; US  
 1999-240755 19990129; US 1999-344667 19990625; US 2000-176409P  
 20000113; US 2000-192699P 20000328; US 2000-200161P 20000426; US  
 2000-603830 20000626; US 2000-224631P 20000811  
 AN 2002-608256 [65] WPIDS  
 CR 1998-145263 [13]; 2001-061976 [07]; 2001-451868 [48]; 2001-656926 [75];  
 2002-258024 [30]; 2003-092900 [08]; 2003-174167 [17]; 2003-182627 [18];  
 2003-198491 [19]; 2003-228114 [22]; 2003-228115 [22]; 2003-237646 [23];  
 2003-247253 [24]; 2003-430409 [40]; 2003-479398 [45]; 2003-521746 [49];  
 2003-576420 [54]; 2003-596264 [56]; 2003-596265 [56]; 2003-615795 [58];  
 2003-634854 [60]  
 AB WO 200246472 A UPAB: 20030919



NOVELTY - Detecting (M1) nucleic acid having two portions, involves providing **nanoparticles** having **oligonucleotides** attached to it, which has a **sequence complementary** to **sequence** of two portions of nucleic acid, contacting nucleic acid and **nanoparticles**, to allow **hybridization** of **oligonucleotides** with two or more portions of nucleic acid, and observing a detectable change brought about by **hybridization**.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

- (1) a kit comprising a container holding a composition comprising two types of **nanoparticles** having **oligonucleotides** attached to it, where the **oligonucleotides** on the first type of **nanoparticles** has a **sequence complementary** to the **sequence** of a first portion of a nucleic acid, and the **oligonucleotides** on the second type of **nanoparticles** has a **sequence complementary** to the **sequence** of a second portion of the nucleic acid;
- (2) an aggregate **probe** comprising at least two types of **nanoparticles** having **oligonucleotides** attached to it, where the **nanoparticles** of the aggregate **probe** is bound to each other as a result of the **hybridization** of some of the **oligonucleotides** attached to them, and has **oligonucleotides** having attached to it which have a **sequence complementary** to a portion of the **sequence** of a nucleic acid;
- (3) a core **probe** comprising at least two types of **nanoparticles** having **oligonucleotides** attached to it, where the **nanoparticles** is bound to each other as a result of **hybridization** of some of the **oligonucleotides** attached to it;
- (4) a substrate having **nanoparticles** attached to it;
- (5) a metallic or semiconductor **nanoparticle** having **oligonucleotides** attached to it, where the **oligonucleotides** are labeled with fluorescent molecules at the ends not attached to the **nanoparticle**;
- (6) a satellite **probe** comprising a particle having **oligonucleotides** attached to it, and **probe oligonucleotides** hybridized to the **oligonucleotides** attached to the **nanoparticles**, and having a first portion and a second portion, where the first portion has a **sequence complementary** to the **sequence** of the first portion of **oligonucleotides** attached to the particles, and both portions has **sequences complementary** to portions of the **sequence** of the nucleic acid, and the **probe oligonucleotide** further has a **reporter** molecule attached to one end;
- (7) a composition comprising at least two types of **nanoparticles** having **oligonucleotides** attached to it;
- (8) an assembly of containers comprising a first and second containers holding **nanoparticles** having **oligonucleotides** attached to it, which has a **sequence complementary** to that of the **oligonucleotides** attached to the **nanoparticles** in the containers;
- (9) a **nanoparticle** (I) having several different **oligonucleotides** attached to it which comprises recognition **oligonucleotides**, each comprising a spacer portion designed so that it is bound to the **nanoparticle**, and a recognition portion having a **sequence complementary** to a portion of the **sequence** of the nucleic acid or another **oligonucleotide**, and optionally a type of diluent **oligonucleotides**;
- (10) binding (M2) **oligonucleotides** to charged **nanoparticles** to produce stable **nanoparticle-oligonucleotide** conjugates;
- (11) **nanoparticle-oligonucleotide** conjugates (II)

which are **nanoparticles** having **oligonucleotides** attached to them which is present on the surface of the nanoparticles at a surface density sufficient so that the conjugates are stable and having a **sequence complementary** to a portion of the **sequence** of a nucleic acid or another oligonucleotide, and a covalently bound cyclic disulfide or polythiol functional group;

(12) oligonucleotides having a covalently bound cyclic disulfide or polythiol functional group that can bind to the nanoparticles;

(13) a nanoparticle conjugate for detecting an analyte, comprising **nanoparticles** having **oligonucleotides** bound to it, and **oligonucleotide** having bound to it a specific binding complement of an analyte having a **sequence** that is **complementary** to a portion of the **oligonucleotides** bound to the **nanoparticles** and are bound, as a result of **hybridization**, and a linker oligonucleotide having two portions;

(14) nonmaterials (III) or nanostructures composed of **nanoparticles** having **oligonucleotides** attached to it, where the **nanoparticles** are held together by **oligonucleotide** connectors;

(15) a kit for detecting an analyte, comprising a container holding (II), and optional support for observing a detectable change;

(16) a nanomaterial produced, by providing linking **oligonucleotide** comprising two portions, two types of **nanoparticles** having **oligonucleotides** attached to it, and a complex comprised of streptavidin or avidin bound to two or more biotin molecules, each having an oligonucleotide bound to the biotin molecule, which has a **sequence** that is **complementary** to the second portion of the linking oligonucleotide, and contacting the first and second types of **nanoparticles**, the linking **oligonucleotides** and the complex, to allow **hybridization** of the **oligonucleotides** on the **nanoparticles** to each other and to the linking **oligonucleotide** and the **hybridization** of the oligonucleotide of the complexes to the linking oligonucleotides so that a desired nanomaterials or nanostructures is formed; and

(17) accelerating movement of a nanoparticle to an electrode surface.

USE - (M1), (I), (II) and the aggregate **probe** are useful for detecting two or more nucleic acids (from a biological source) having at least two portions, such as viral RNA, bacterial or fungal DNA, a gene associated with a disease, synthetic, or structurally-modified natural or synthetic RNA or DNA, or a product of a polymerase chain reaction amplification. (II) is useful for preparing a nanoprobe conjugate for detecting an analyte, and for detecting a nucleic acid bound to an electrode surface. (I) and (II) are useful for fabrication, and for separating a selected nucleic acid having two portions from other nucleic acids. (I), (II) and the aggregate **probe** are useful for detecting an analyte (especially polyvalent analyte) in a sample (all claimed).

ADVANTAGE - Diagnostic assays employing (II) improve the sensitivity of the assay.  
Dwg.0/67

L8 ANSWER 9 OF 41 USPATFULL on STN  
AN 2003:294281 USPATFULL  
TI Nanoparticles having oligonucleotides attached thereto and uses therefor  
IN Park, So-Jung, Austin, TX, UNITED STATES  
Taton, Thomas Andrew, Little Canada, MN, UNITED STATES  
Mirkin, Chad A., Wilmette, IL, UNITED STATES  
PI US 2003207296 A1 20031106  
AI US 2002-266983 A1 20021008 (10)  
RLI Continuation-in-part of Ser. No. US 2001-8978, filed on 7 Dec 2001,  
PENDING Continuation-in-part of Ser. No. US 2001-927777, filed on 10 Aug

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2001, PENDING Continuation-in-part of Ser. No. US 2001-820279, filed on 28 Mar 2001, PENDING Continuation-in-part of Ser. No. US 2001-760500, filed on 12 Jan 2001, PENDING Continuation-in-part of Ser. No. US 2000-603830, filed on 26 Jun 2000, GRANTED, Pat. No. US 6506564 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, PENDING

PRAI US 2001-327864P 20011009 (60)  
US 2000-254418P 20001208 (60)  
US 2000-255236P 20001211 (60)  
US 2001-282640P 20010409 (60)  
US 2000-224631P 20000811 (60)  
US 2000-192699P 20000328 (60)  
US 2000-254392P 20001208 (60)  
US 2000-255235P 20001211 (60)  
US 2000-176409P 20000113 (60)  
US 2000-213906P 20000626 (60)  
US 2000-200161P 20000426 (60)  
US 1996-31809P 19960729 (60)

DT Utility

FS APPLICATION

LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE 3200, CHICAGO, IL, 60606

CLMN Number of Claims: 677

ECL Exemplary Claim: 1

DRWN 75 Drawing Page(s)

LN.CNT 12981

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

L8 ANSWER 10 OF 41 USPATFULL on STN

AN 2003:282617 USPATFULL

TI Signal amplifying targeted reporters for biological and chemical sensor applications

IN Fan, Wenhong, Mountain View, CA, UNITED STATES

Li, Jun, Sunnyvale, CA, UNITED STATES

Han, Jie, Cupertino, CA, UNITED STATES

PI US 2003198960 A1 20031023

AI US 2002-114776 A1 20020401 (10)

DT Utility

FS APPLICATION

LREP FISH & NEAVE, 1251 AVENUE OF THE AMERICAS, 50TH FLOOR, NEW YORK, NY, 10020-1105

CLMN Number of Claims: 39

ECL Exemplary Claim: 1

DRWN 2 Drawing Page(s)

LN.CNT 1615

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AB The present invention provides targeted dendrimeric **reporter** molecules that provide amplified signals at electrochemical sensors, and methods of synthesis and methods of use thereof. The **reporter** molecules comprise a targeting moiety and at least one dendritic signal amplifier; the dendritic amplifier comprises a plurality of dendritic branches and a plurality of indicator moieties, typically pendant therefrom. The targeting moiety serves to concentrate the dendritic amplifier at a selected target, where the plural indicator provide increased signals.

L8 ANSWER 11 OF 41 USPATFULL on STN

AN 2003:257732 USPATFULL

TI Nanoparticles having oligonucleotides attached thereto and uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES

Letsinger, Robert L., Bloomington, IN, UNITED STATES

Mucic, Robert C., Glendale, CA, UNITED STATES

Storhoff, James J., Evanston, IL, UNITED STATES

Elghanian, Robert, Skokie, IL, UNITED STATES

Taton, Thomas Andrew, Little Canada, MN, UNITED STATES

PA Nanosphere, Inc. (U.S. corporation)

PI US 2003180783 A1 20030925

AI US 2003-410324 A1 20030409 (10)

RLI Continuation of Ser. No. US 2001-961949, filed on 20 Sep 2001, GRANTED, Pat. No. US 6582921 Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, GRANTED, Pat. No. US 6506564 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, PENDING

PRAI US 1996-31809P 19960729 (60)

DT Utility

FS APPLICATION

LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606

CLMN Number of Claims: 431

ECL Exemplary Claim: 1

DRWN 31 Drawing Page(s)

LN.CNT 8062

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 12 OF 41 USPATFULL on STN

AN 2003:237907 USPATFULL

TI Compositions and methods for the therapy and diagnosis of colon cancer

IN King, Gordon E., Shoreline, WA, UNITED STATES

09567863

Meagher, Madeleine Joy, Seattle, WA, UNITED STATES  
Xu, Jiangchun, Bellevue, WA, UNITED STATES  
Secrist, Heather, Seattle, WA, UNITED STATES  
Jiang, Yuqiu, Kent, WA, UNITED STATES

PA Corixa Corporation, Seattle, WA, UNITED STATES, 98104 (U.S. corporation)

PI US 2003166064 A1 20030904

AI US 2002-99926 A1 20020314 (10)

RLI Continuation-in-part of Ser. No. US 2001-33528, filed on 26 Dec 2001,  
PENDING Continuation-in-part of Ser. No. US 2001-920300, filed on 31 Jul  
2001, PENDING

PRAI US 2001-302051P 20010629 (60)

US 2001-279763P 20010328 (60)

US 2000-223283P 20000803 (60)

DT Utility

FS APPLICATION

LREP SEED INTELLECTUAL PROPERTY LAW GROUP PLLC, 701 FIFTH AVE, SUITE 6300,  
SEATTLE, WA, 98104-7092

CLMN Number of Claims: 17

ECL Exemplary Claim: 1

DRWN No Drawings

LN.CNT 8531

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Compositions and methods for the therapy and diagnosis of cancer,  
particularly colon cancer, are disclosed. Illustrative compositions  
comprise one or more colon tumor polypeptides, immunogenic portions  
thereof, polynucleotides that encode such polypeptides, antigen  
presenting cell that expresses such polypeptides, and T cells that are  
specific for cells expressing such polypeptides. The disclosed  
compositions are useful, for example, in the diagnosis, prevention  
and/or treatment of diseases, particularly colon cancer.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 13 OF 41 USPATFULL on STN

AN 2003:213644 USPATFULL

TI Nanoparticles having oligonucleotides attached thereto and uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES

Letsinger, Robert L., Wilmette, IL, UNITED STATES

Mucic, Robert C., Glendale, CA, UNITED STATES

Storhoff, James J., Evanston, IL, UNITED STATES

Elghanian, Robert, Skokie, IL, UNITED STATES

Taton, Thomas A., Little Canada, MN, UNITED STATES

PA Nanosphere, Inc. (U.S. corporation)

PI US 2003148282 A1 20030807

AI US 2001-976968 A1 20011012 (9)

RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, GRANTED,  
Pat. No. US 6506564 Continuation-in-part of Ser. No. US 1999-344667,  
filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part  
of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED  
Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997,  
PENDING

PRAI US 1996-31809P 19960729 (60)

US 2000-200161P 20000426 (60)

DT Utility

FS APPLICATION

LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.  
Wacker Drive, Chicago, IL, 60606

CLMN Number of Claims: 431

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 8043

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 14 OF 41 USPATFULL on STN  
 AN 2003:207180 USPATFULL  
 TI Nanoparticles having oligonucleotides attached thereto and uses therefor  
 IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
 Letsinger, Robert L., Wilmette, IL, UNITED STATES  
 Mucic, Robert C., Glendale, CA, UNITED STATES  
 Storhoff, James J., Evanston, IL, UNITED STATES  
 Elghanian, Robert, Skokie, IL, UNITED STATES  
 Tatton, Thomas A., Little Canada, MN, UNITED STATES  
 PA Nanosphere, Inc. (U.S. corporation)  
 PI US 2003143538 A1 20030731  
 AI US 2001-975059 A1 20011011 (9)  
 RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, GRANTED, Pat. No. US 6506564 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, PENDING  
 PRAI US 1996-31809P 19960729 (60)  
 US 2000-200161P 20000426 (60)  
 DT Utility  
 FS APPLICATION  
 LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606  
 CLMN Number of Claims: 431  
 ECL Exemplary Claim: 1  
 DRWN 46 Drawing Page(s)  
 LN.CNT 8062

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

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CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 15 OF 41 USPATFULL on STN  
AN 2003:180699 USPATFULL  
TI Nanoparticles having oligonucleotides attached thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
Letsinger, Robert L., Wilmette, IL, UNITED STATES  
Mucic, Robert C., Glendale, CA, UNITED STATES  
Storhoff, James J., Evanston, IL, UNITED STATES  
Elghanian, Robert, Skokie, IL, UNITED STATES  
Taton, Thomas A., Little Canada, MN, UNITED STATES  
PA Nanosphere, Inc. (U.S. corporation)  
PI US 2003124528 A1 20030703  
AI US 2001-976601 A1 20011012 (9)  
RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING  
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,  
GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US  
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of  
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN  
PRAI US 1996-31809P 19960729 (60)  
US 2000-200161P 20000426 (60)  
DT Utility  
FS APPLICATION  
LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.  
Wacker Drive, Chicago, IL, 60606  
CLMN Number of Claims: 431  
ECL Exemplary Claim: 1  
DRWN 46 Drawing Page(s)  
LN.CNT 8060

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods  
comprise contacting the nucleic acid with one or more types of particles  
having oligonucleotides attached thereto. In one embodiment of the  
method, the oligonucleotides are attached to nanoparticles and have  
sequences complementary to portions of the sequence of the nucleic acid.  
A detectable change (preferably a color change) is brought about as a  
result of the hybridization of the oligonucleotides on the nanoparticles  
to the nucleic acid. The invention also provides compositions and kits  
comprising particles. The invention further provides methods of  
synthesizing unique nanoparticle-oligonucleotide conjugates, the  
conjugates produced by the methods, and methods of using the conjugates.  
In addition, the invention provides nanomaterials and nanostructures  
comprising nanoparticles and methods of nanofabrication utilizing  
nanoparticles. Finally, the invention provides a method of separating a  
selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 16 OF 41 USPATFULL on STN  
AN 2003:165885 USPATFULL  
TI Oligonucleotide-modified ROMP polymers and co-polymers  
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
Nguyen, SonBinh T., Evanston, IL, UNITED STATES  
Watson, Keith J., Midland, MI, UNITED STATES  
Park, So-Jung, Evanston, IL, UNITED STATES  
PI US 2003113740 A1 20030619  
AI US 2002-125194 A1 20020418 (10)  
PRAI US 2001-286615P 20010426 (60)  
DT Utility  
FS APPLICATION  
LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.

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Wacker Drive, Chicago, IL, 60606

CLMN Number of Claims: 70

ECL Exemplary Claim: 1

DRWN 13 Drawing Page(s)

LN.CNT 2495

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Ring-opening metathesis polymerization (ROMP) polymers or copolymers having oligonucleotides bound thereto, materials comprised of the oligonucleotide-modified ROMP polymers, and methods of making and using the same for preparing new materials and for detection of target nucleic acids are disclosed.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 17 OF 41 USPATFULL on STN

AN 2003:127030 USPATFULL

TI Nanoparticles having oligonucleotides attached thereto and uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES

Letsinger, Robert L., Wilmette, IL, UNITED STATES

Taton, Thomas Andrew, Little Canada, MN, UNITED STATES

Lu, Gang, Mt Prospect, IL, UNITED STATES

PI US 2003087242 A1 20030508

AI US 2001-8978 A1 20011207 (10)

RLI Continuation-in-part of Ser. No. US 2001-927777, filed on 10 Aug 2001, PENDING Continuation-in-part of Ser. No. US 2001-820279, filed on 28 Mar 2001, PENDING Continuation-in-part of Ser. No. US 2001-760500, filed on 12 Jan 2001, PENDING Continuation-in-part of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)

US 2000-176409P 20000113 (60)

US 2000-192699P 20000328 (60)

US 2000-200161P 20000426 (60)

US 2000-213906P 20000626 (60)

US 2000-224631P 20000811 (60)

US 2000-254392P 20001208 (60)

US 2000-254418P 20001208 (60)

US 2000-255235P 20001211 (60)

US 2000-255236P 20001211 (60)

US 2001-282640P 20010409 (60)

DT Utility

FS APPLICATION

LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE 3200, CHICAGO, IL, 60606

CLMN Number of Claims: 626

ECL Exemplary Claim: 1

DRWN 71 Drawing Page(s)

LN.CNT 12308

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the



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conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 18 OF 41 USPATFULL on STN  
AN 2003:106233 USPATFULL  
TI Compositions and methods for the therapy and diagnosis of pancreatic cancer  
IN Benson, Darin R., Seattle, WA, UNITED STATES  
Kalos, Michael D., Seattle, WA, UNITED STATES  
Lodes, Michael J., Seattle, WA, UNITED STATES  
Persing, David H., Redmond, WA, UNITED STATES  
Hepler, William T., Seattle, WA, UNITED STATES  
Jiang, Yuqiu, Kent, WA, UNITED STATES  
PA Corixa Corporation, Seattle, WA, UNITED STATES, 98104 (U.S. corporation)  
PI US 2003073144 A1 20030417  
AI US 2002-60036 A1 20020130 (10)  
PRAI US 2001-333626P 20011127 (60)  
US 2001-305484P 20010712 (60)  
US 2001-265305P 20010130 (60)  
US 2001-267568P 20010209 (60)  
US 2001-313999P 20010820 (60)  
US 2001-291631P 20010516 (60)  
US 2001-287112P 20010428 (60)  
US 2001-278651P 20010321 (60)  
US 2001-265682P 20010131 (60)  
DT Utility  
FS APPLICATION  
LREP SEED INTELLECTUAL PROPERTY LAW GROUP PLLC, 701 FIFTH AVE, SUITE 6300, SEATTLE, WA, 98104-7092  
CLMN Number of Claims: 17  
ECL Exemplary Claim: 1  
DRWN No Drawings  
LN.CNT 14253

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Compositions and methods for the therapy and diagnosis of cancer, particularly pancreatic cancer, are disclosed. Illustrative compositions comprise one or more pancreatic tumor polypeptides, immunogenic portions thereof, polynucleotides that encode such polypeptides, antigen presenting cell that expresses such polypeptides, and T cells that are specific for cells expressing such polypeptides. The disclosed compositions are useful, for example, in the diagnosis, prevention and/or treatment of diseases, particularly pancreatic cancer.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 19 OF 41 USPATFULL on STN  
AN 2003:86172 USPATFULL  
TI Nanoparticles having oligonucleotides attached thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
Letsinger, Robert L., Wilmette, IL, UNITED STATES  
Mucic, Robert C., Glendale, CA, UNITED STATES  
Storhoff, James J., Evanston, IL, UNITED STATES  
Elghanian, Robert, Skokie, IL, UNITED STATES  
Taton, Thomas A., Little Canada, MN, UNITED STATES  
PA Nanosphere, Inc. (U.S. corporation)  
PI US 2003059777 A1 20030327  
US 6645721 B2 20031111

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AI US 2001-957313 A1 20010920 (9)  
RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING  
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,  
GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US  
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of  
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN  
PRAI US 1996-31809P 19960729 (60)  
US 2000-200161P 20000426 (60)  
DT Utility  
FS APPLICATION  
LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.  
Wacker Drive, Chicago, IL, 60606  
CLMN Number of Claims: 431  
ECL Exemplary Claim: 1  
DRWN 46 Drawing Page(s)  
LN.CNT 8060

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods  
comprise contacting the nucleic acid with one or more types of particles  
having oligonucleotides attached thereto. In one embodiment of the  
method, the oligonucleotides are attached to nanoparticles and have  
sequences complementary to portions of the sequence of the nucleic acid.  
A detectable change (preferably a color change) is brought about as a  
result of the hybridization of the oligonucleotides on the nanoparticles  
to the nucleic acid. The invention also provides compositions and kits  
comprising particles. The invention further provides methods of  
synthesizing unique nanoparticle-oligonucleotide conjugates, the  
conjugates produced by the methods, and methods of using the conjugates.  
In addition, the invention provides nanomaterials and nanostructures  
comprising nanoparticles and methods of nanofabrication utilizing  
nanoparticles. Finally, the invention provides a method of separating a  
selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 20 OF 41 USPATFULL on STN  
AN 2003:78438 USPATFULL  
TI Nanoparticles having oligonucleotides attached thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
Letsinger, Robert L., Wilmette, IL, UNITED STATES  
Mucic, Robert C., Glendale, CA, UNITED STATES  
Storhoff, James J., Evanston, IL, UNITED STATES  
Elghanian, Robert, Skokie, IL, UNITED STATES  
Taton, Thomas A., Little Canada, MN, UNITED STATES  
PA Nanosphere, Inc. (U.S. corporation)  
PI US 2003054358 A1 20030320  
AI US 2001-975376 A1 20011011 (9)  
RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING  
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,  
GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US  
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of  
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN  
PRAI US 1996-31809P 19960729 (60)  
US 2000-200161P 20000426 (60)  
DT Utility  
FS APPLICATION  
LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.  
Wacker Drive, Chicago, IL, 60606  
CLMN Number of Claims: 431  
ECL Exemplary Claim: 1  
DRWN 46 Drawing Page(s)  
LN.CNT 8059

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 21 OF 41 USPATFULL on STN

AN 2003:71346 USPATFULL

TI **Nanoparticles** having **oligonucleotides** attached thereto and uses therefor

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
 Letsinger, Robert L., Wilmette, IL, UNITED STATES  
 Mucic, Robert C., Glendale, CA, UNITED STATES  
 Storhoff, James J., Evanston, IL, UNITED STATES  
 Elghanian, Robert, Skokie, IL, UNITED STATES  
 Taton, Thomas A., Little Canada, MN, UNITED STATES

PA Nanosphere, Inc.

PI US 2003049631 A1 20030313

AI US 2001-974500 A1 20011010 (9)

RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING  
 Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,  
 GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US  
 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of  
 Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)

US 2000-200161P 20000426 (60)

DT Utility

FS APPLICATION

LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.  
 Wacker Drive, Chicago, IL, 60606

CLMN Number of Claims: 172

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 6565

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise (contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto, In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have **sequences complementary** to portions of the **sequence** of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles The invention further provides nanomaterials and iianostrucures comprising nanoparticles and methods of nanofabrication utilizing the nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

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CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 22 OF 41 USPATFULL on STN  
AN 2003:30222 USPATFULL  
TI Nanoparticles having oligonucleotides attached thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
Letsinger, Robert L., Wilmette, IL, UNITED STATES  
Park, So-Jung, Evanston, IL, UNITED STATES  
PI US 2003022169 A1 20030130  
AI US 2001-820279 A1 20010328 (9)  
RLI Continuation-in-part of Ser. No. US 2001-760500, filed on 12 Jan 2001,  
PENDING Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun  
1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US  
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of  
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN  
PRAI US 1996-31809P 19960729 (60)  
US 2000-176409P 20000113 (60)  
US 2000-200161P 20000426 (60)  
US 2000-192699P 20000328 (60)  
US 2000-254392P 20001208 (60)  
US 2000-255235P 20001211 (60)  
DT Utility  
FS APPLICATION  
LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE  
3200, CHICAGO, IL, 60606  
CLMN Number of Claims: 570  
ECL Exemplary Claim: 1  
DRWN 65 Drawing Page(s)  
LN.CNT 11127

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods  
comprise contacting the nucleic acid with one or more types of particles  
having oligonucleotides attached thereto. In one embodiment of the  
method, the oligonucleotides are attached to nanoparticles and have  
sequences complementary to portions of the sequence of the nucleic acid.  
A detectable change (preferably a color change) is brought about as a  
result of the hybridization of the oligonucleotides on the nanoparticles  
to the nucleic acid. The invention also provides compositions and kits  
comprising particles. The invention further provides methods of  
synthesizing unique nanoparticle-oligonucleotide conjugates, the  
conjugates produced by the methods, and methods of using the conjugates.  
In addition, the invention provides nanomaterials and nanostructures  
comprising nanoparticles and methods of nanofabrication utilizing  
nanoparticles. Finally, the invention provides a method of separating a  
selected nucleic acid from other nucleic acids.F

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 23 OF 41 USPATFULL on STN  
AN 2003:13189 USPATFULL  
TI **Nanoparticles** having **oligonucleotides** attached  
thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, United States  
Letsinger, Robert L., Wilmette, IL, United States  
Mucic, Robert C., Glendale, CA, United States  
Storhoff, James J., Evanston, IL, United States  
Elghanian, Robert, Chicago, IL, United States  
Taton, Thomas A., Chicago, IL, United States  
PA Nanosphere, Inc., Northbrook, IL, United States (U.S. corporation)  
PI US 6506564 B1 20030114  
AI US 2000-603830 20000626 (9)

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RLI Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999  
Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999  
Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997  
PRAI US 2000-200161P 20000426 (60)  
US 1996-31809P 19960729 (60)  
DT Utility  
FS GRANTED  
EXNAM Primary Examiner: Riley, Jezia  
LREP McDonnell Boehnen Hulbert & Berghoff  
CLMN Number of Claims: 42  
ECL Exemplary Claim: 1  
DRWN 84 Drawing Figure(s); 47 Drawing Page(s)  
LN.CNT 5976

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have **sequences complementary** to portions of the **sequence** of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique **nanoparticle-oligonucleotide** conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 24 OF 41 USPATFULL on STN  
AN 2002:337329 USPATFULL  
TI Bio-barcodes based on **oligonucleotide-modified nanoparticles**  
IN Mirkin, Chad A., Willmette, IL, UNITED STATES  
Park, So-Jung, Evanston, IL, UNITED STATES  
Nam, Jwa-Min, Evanston, IL, UNITED STATES  
PI US 2002192687 A1 20021219  
AI US 2002-108211 A1 20020327 (10)  
RLI Continuation-in-part of Ser. No. US 2001-820279, filed on 28 Mar 2001, PENDING  
PRAI WO 2001-US10071 20010328  
US 2000-192699P 20000328 (60)  
US 2001-350560P 20011113 (60)  
DT Utility  
FS APPLICATION  
LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE 3200, CHICAGO, IL, 60606  
CLMN Number of Claims: 41  
ECL Exemplary Claim: 1  
DRWN 4 Drawing Page(s)  
LN.CNT 2185

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention relates to a screening methods, compositions, and kits for detecting for the presence or absence of one or more target analytes, e.g. proteins such as antibodies, in a sample. In particular, the present invention relates to a method that utilizes **reporter oligonucleotides** as biochemical barcodes for detecting multiple

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protein structures or other target analytes in one solution.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 25 OF 41 USPATFULL on STN  
AN 2002:332594 USPATFULL  
TI **Nanoparticles** having **oligonucleotides** attached thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, United States  
Letsinger, Robert L., Wilmette, IL, United States  
Mucic, Robert C., Glendale, CA, United States  
Storhoff, James J., Evanston, IL, United States  
Elghanian, Robert, Chicago, IL, United States  
PA Nanosphere, Inc., Northbrook, IL, United States (U.S. corporation)  
PI US 6495324 B1 20021217  
AI US 2000-693005 20001020 (9)  
RLI Division of Ser. No. US 1999-344667, filed on 25 Jun 1999  
Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999  
Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997  
PRAI US 1996-31809P 19960729 (60)  
DT Utility  
FS GRANTED  
EXNAM Primary Examiner: Riley, Jezia  
LREP McDonnell Boehnen Hulbert & Berghoff  
CLMN Number of Claims: 21  
ECL Exemplary Claim: 1  
DRWN 62 Drawing Figure(s); 34 Drawing Page(s)  
LN.CNT 4289

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have **sequences complementary** to portions of the **sequence** of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing the nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 26 OF 41 USPATFULL on STN  
AN 2002:322447 USPATFULL  
TI **Nanoparticles** having **oligonucleotides** attached thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
Letsinger, Robert L., Wilmette, IL, UNITED STATES  
Mucic, Robert C., Glendale, CA, UNITED STATES  
Storhoff, James J., Evanston, IL, UNITED STATES  
Elghanian, Robert, Skokie, IL, UNITED STATES  
Taton, Thomas A., Little Canada, MN, UNITED STATES  
PA Nanosphere, Inc. (U.S. corporation)  
PI US 2002182611 A1 20021205  
US 6610491 B2 20030826  
AI US 2001-966491 A1 20010928 (9)  
RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING  
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,

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GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)  
US 2000-200161P 20000426 (60)

DT Utility

FS APPLICATION

LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE 3200, CHICAGO, IL, 60606

CLMN Number of Claims: 190

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 6646

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have **sequences complementary** to portions of the **sequence** of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing the nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 27 OF 41 USPATFULL on STN

AN 2002:307830 USPATFULL

TI Movement of biomolecule-coated nanoparticles in an electric field

IN Mirkin, Chad A., Wilmette, IL, UNITED STATES

Letsinger, Robert L., Wilmette, IL, UNITED STATES

Mucic, Robert C., Glendale, CA, UNITED STATES

Storhoff, James J., Evanston, IL, UNITED STATES

Elghanian, Robert, Chicago, IL, UNITED STATES

Taton, Thomas Andrew, Chicago, IL, UNITED STATES

Garimella, Viswanadham, Evanston, IL, UNITED STATES

Li, Zhi, Evanston, IL, UNITED STATES

Park, So-Jung, Evanston, IL, UNITED STATES

PI US 2002172953 A1 20021121

AI US 2001-927777 A1 20010810 (9)

RLI Continuation-in-part of Ser. No. US 2001-820279, filed on 28 Mar 2001, PENDING Continuation-in-part of Ser. No. US 2001-760500, filed on 12 Jan 2001, PENDING Continuation-in-part of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

PRAI US 1996-31809P 19960729 (60)

US 2000-176409P 20000113 (60)

US 2000-200161P 20000426 (60)

US 2000-192699P 20000328 (60)

US 2000-254392P 20001208 (60)

US 2000-255235P 20001211 (60)

US 2000-224631P 20000811 (60)

DT Utility

FS APPLICATION

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LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.  
Wacker Drive, Chicago, IL, 60606  
CLMN Number of Claims: 598  
ECL Exemplary Claim: 1  
DRWN 64 Drawing Page(s)  
LN.CNT 11435

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 28 OF 41 USPATFULL on STN  
AN 2002:280008 USPATFULL  
TI Nanoparticles having oligonucleotides attached thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
Letsinger, Robert L., Wilmette, IL, UNITED STATES  
Mucic, Robert C., Glendale, CA, UNITED STATES  
Storhoff, James J., Evanston, IL, UNITED STATES  
Elghanian, Robert, Chicago, IL, UNITED STATES  
Taton, Thomas A., Little Canada, MN, UNITED STATES  
Garimella, Viswanadham, Evanston, IL, UNITED STATES  
Li, Zhi, Evanston, IL, UNITED STATES  
PI US 2002155442 A1 20021024  
AI US 2001-760500 A1 20010112 (9)  
RLI Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN  
PRAI US 1996-31809P 19960729 (60)  
US 2000-200161P 20000426 (60)  
US 2000-176409P 20000113 (60)  
US 2000-213906P 20000626 (60)  
DT Utility  
FS APPLICATION  
LREP MCDONNELL BOEHNEN HULBERT & BERGHOFF, 300 SOUTH WACKER DRIVE, SUITE  
3200, CHICAGO, IL, 60606  
CLMN Number of Claims: 485  
ECL Exemplary Claim: 1  
DRWN 51 Drawing Page(s)  
LN.CNT 8754

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles



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to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 29 OF 41 USPATFULL on STN  
AN 2002:272801 USPATFULL  
TI Compositions and methods for the therapy and diagnosis of colon cancer  
IN Stolk, John A., Bothell, WA, UNITED STATES  
Xu, Jiangchun, Bellevue, WA, UNITED STATES  
Chenault, Ruth A., Seattle, WA, UNITED STATES  
Meagher, Madeleine Joy, Seattle, WA, UNITED STATES  
PA Corixa Corporation, Seattle, WA, UNITED STATES, 98104 (U.S. corporation)  
PI US 2002150922 A1 20021017  
AI US 2001-998598 A1 20011116 (9)  
PRAI US 2001-304037P 20010710 (60)  
US 2001-279670P 20010328 (60)  
US 2001-267011P 20010206 (60)  
US 2000-252222P 20001120 (60)  
DT Utility  
FS APPLICATION  
LREP SEED INTELLECTUAL PROPERTY LAW GROUP PLLC, 701 FIFTH AVE, SUITE 6300,  
SEATTLE, WA, 98104-7092  
CLMN Number of Claims: 17  
ECL Exemplary Claim: 1  
DRWN No Drawings  
LN.CNT 9233

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Compositions and methods for the therapy and diagnosis of cancer, particularly colon cancer, are disclosed. Illustrative compositions comprise one or more colon tumor polypeptides, immunogenic portions thereof, polynucleotides that encode such polypeptides, antigen presenting cell that expresses such polypeptides, and T cells that are specific for cells expressing such polypeptides. The disclosed compositions are useful, for example, in the diagnosis, prevention and/or treatment of diseases, particularly colon cancer.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 30 OF 41 USPATFULL on STN  
AN 2002:251128 USPATFULL  
TI Nanoparticles having oligonucleotides attached thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
Letsinger, Robert L., Wilmette, IL, UNITED STATES  
Mucic, Robert C., Glendale, CA, UNITED STATES  
Storhoff, James J., Evanston, IL, UNITED STATES  
Elghanian, Robert, Skokie, IL, UNITED STATES  
Taton, Thomas A., Little Canada, MN, UNITED STATES  
PA Nanosphere, Inc. (U.S. corporation)  
PI US 2002137072 A1 20020926  
AI US 2001-976617 A1 20011012 (9)  
RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING  
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,  
GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US  
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of  
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN

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PRAI US 1996-31809P 19960729 (60)  
US 2000-200161P 20000426 (60)  
DT Utility  
FS APPLICATION  
LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.  
Wacker Drive, Chicago, IL, 60606  
CLMN Number of Claims: 431  
ECL Exemplary Claim: 1  
DRWN 46 Drawing Page(s)  
LN.CNT 8061

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 31 OF 41 USPATFULL on STN  
AN 2002:251127 USPATFULL  
TI Nanoparticles having oligonucleotides attached thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
Letsinger, Robert L., Wilmette, IL, UNITED STATES  
Mucic, Robert C., Glendale, CA, UNITED STATES  
Storhoff, James J., Evanston, IL, UNITED STATES  
Elghanian, Robert, Skokie, IL, UNITED STATES  
Taton, Thomas A., Little Canada, MN, UNITED STATES  
PA Nanosphere, Inc. (U.S. corporation)  
PI US 2002137071 A1 20020926  
AI US 2001-974007 A1 20011010 (9)  
RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING  
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,  
GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US  
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of  
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN  
PRAI US 1996-31809P 19960729 (60)  
US 2000-200161P 20000426 (60)  
DT Utility  
FS APPLICATION  
LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.  
Wacker Drive, Chicago, IL, 60606  
CLMN Number of Claims: 431  
ECL Exemplary Claim: 1  
DRWN 46 Drawing Page(s)  
LN.CNT 8063

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid.

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A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 32 OF 41 USPATFULL on STN  
AN 2002:251126 USPATFULL  
TI Nanoparticles having oligonucleotides attached thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
Letsinger, Robert L., Wilmette, IL, UNITED STATES  
Mucic, Robert C., Glendale, CA, UNITED STATES  
Storhoff, James J., Evanston, IL, UNITED STATES  
Elghanian, Robert, Skokie, IL, UNITED STATES  
Taton, Thomas A., Little Canada, MN, UNITED STATES  
PA Nanosphere, Inc. (U.S. corporation)  
PI US 2002137070 A1 20020926  
AI US 2001-973638 A1 20011010 (9)  
RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING  
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999,  
GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US  
1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of  
Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN  
PRAI US 1996-31809P 19960729 (60)  
US 2000-200161P 20000426 (60)  
DT Utility  
FS APPLICATION  
LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.  
Wacker Drive, Chicago, IL, 60606  
CLMN Number of Claims: 431  
ECL Exemplary Claim: 1  
DRWN 46 Drawing Page(s)  
LN.CNT 8060

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 33 OF 41 USPATFULL on STN  
AN 2002:251114 USPATFULL  
TI Nanoparticles having oligonucleotides attached

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thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
Letsinger, Robert L., Wilmette, IL, UNITED STATES  
Mucic, Robert C., Glendale, CA, UNITED STATES  
Storhoff, James J., Evanston, IL, UNITED STATES  
Elghanian, Robert, Chicago, IL, UNITED STATES  
PA Nanosphere, Inc. (U.S. corporation)  
PI US 2002137058 A1 20020926  
AI US 2001-923625 A1 20010807 (9)  
RLI Continuation of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED  
Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997,  
UNKNOWN  
PRAI US 1996-31809P 19960729 (60)  
DT Utility  
FS APPLICATION  
LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S.  
Wacker Drive, Chicago, IL, 60606  
CLMN Number of Claims: 105  
ECL Exemplary Claim: 1  
DRWN 26 Drawing Page(s)  
LN.CNT 3903

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods  
comprise contacting the nucleic acid with one or more types of particles  
having oligonucleotides attached thereto. In one embodiment of the  
method, the **oligonucleotides** are attached to  
**nanoparticles** and have **sequences complementary**  
to portions of the **sequence** of the nucleic acid. A detectable  
change (preferably a color change) is brought about as a result of the  
**hybridization** of the **oligonucleotides** on the  
**nanoparticles** to the nucleic acid. The invention also provides  
compositions and kits comprising particles. The invention further  
provides nanomaterials and nanostructures comprising nanoparticles and  
methods of nanofabrication utilizing the nanoparticles. Finally, the  
invention provides a method of separating a selected nucleic acid from  
other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 34 OF 41 USPATFULL on STN  
AN 2002:243051 USPATFULL  
TI Compositions and methods for the therapy and diagnosis of ovarian cancer  
IN Algate, Paul A., Issaquah, WA, UNITED STATES  
Jones, Robert, Seattle, WA, UNITED STATES  
Harlocker, Susan L., Seattle, WA, UNITED STATES  
PA Corixa Corporation, Seattle, WA, UNITED STATES, 98104 (U.S. corporation)  
PI US 2002132237 A1 20020919  
AI US 2001-867701 A1 20010529 (9)  
PRAI US 2000-207484P 20000526 (60)  
DT Utility  
FS APPLICATION  
LREP SEED INTELLECTUAL PROPERTY LAW GROUP PLLC, 701 FIFTH AVE, SUITE 6300,  
SEATTLE, WA, 98104-7092  
CLMN Number of Claims: 11  
ECL Exemplary Claim: 1  
DRWN No Drawings  
LN.CNT 25718

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Compositions and methods for the therapy and diagnosis of cancer,  
particularly ovarian cancer, are disclosed. Illustrative compositions  
comprise one or more ovarian tumor polypeptides, immunogenic portions  
thereof, polynucleotides that encode such polypeptides, antigen

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presenting cell that expresses such polypeptides, and T cells that are specific for cells expressing such polypeptides. The disclosed compositions are useful, for example, in the diagnosis, prevention and/or treatment of diseases, particularly ovarian cancer.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 35 OF 41 USPATFULL on STN  
AN 2002:242791 USPATFULL  
TI Compositions and methods for the therapy and diagnosis of colon cancer  
IN King, Gordon E., Shoreline, WA, UNITED STATES  
Meagher, Madeleine Joy, Seattle, WA, UNITED STATES  
Xu, Jiangchun, Bellevue, WA, UNITED STATES  
Secrist, Heather, Seattle, WA, UNITED STATES  
PA Corixa Corporation, Seattle, WA, UNITED STATES (U.S. corporation)  
PI US 2002131971 A1 20020919  
AI US 2001-33528 A1 20011226 (10)  
RLI Continuation-in-part of Ser. No. US 2001-920300, filed on 31 Jul 2001, PENDING  
PRAI US 2001-302051P 20010629 (60)  
US 2001-279763P 20010328 (60)  
US 2000-223283P 20000803 (60)  
DT Utility  
FS APPLICATION  
LREP SEED INTELLECTUAL PROPERTY LAW GROUP PLLC, 701 FIFTH AVE, SUITE 6300, SEATTLE, WA, 98104-7092  
CLMN Number of Claims: 17  
ECL Exemplary Claim: 1  
DRWN No Drawings  
LN.CNT 8083

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Compositions and methods for the therapy and diagnosis of cancer, particularly colon cancer, are disclosed. Illustrative compositions comprise one or more colon tumor polypeptides, immunogenic portions thereof, polynucleotides that encode such polypeptides, antigen presenting cell that expresses such polypeptides, and T cells that are specific for cells expressing such polypeptides. The disclosed compositions are useful, for example, in the diagnosis, prevention and/or treatment of diseases, particularly colon cancer.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 36 OF 41 USPATFULL on STN  
AN 2002:235385 USPATFULL  
TI Nanoparticles having oligonucleotides attached thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, UNITED STATES  
Letsinger, Robert L., Wilmette, IL, UNITED STATES  
Mucic, Robert C., Glendale, CA, UNITED STATES  
Storhoff, James J., Evanston, IL, UNITED STATES  
Elghanian, Robert, Skokie, IL, UNITED STATES  
Taton, Thomas A., Little Canada, MN, UNITED STATES  
PA Nanosphere, Inc. (U.S. corporation)  
PI US 2002127574 A1 20020912  
AI US 2001-973788 A1 20011010 (9)  
RLI Continuation of Ser. No. US 2000-603830, filed on 26 Jun 2000, PENDING  
Continuation-in-part of Ser. No. US 1999-344667, filed on 25 Jun 1999, GRANTED, Pat. No. US 6361944 Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999, ABANDONED Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997, UNKNOWN  
PRAI US 1996-31809P 19960729 (60)  
US 2000-200161P 20000426 (60)  
DT Utility

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FS APPLICATION

LREP Emily Miao, McDonnell Boehnen Hulbert & Berghoff, 32nd Floor, 300 S. Wacker Drive, Chicago, IL, 60606

CLMN Number of Claims: 431

ECL Exemplary Claim: 1

DRWN 46 Drawing Page(s)

LN.CNT 8060

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the oligonucleotides are attached to nanoparticles and have sequences complementary to portions of the sequence of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the hybridization of the oligonucleotides on the nanoparticles to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides methods of synthesizing unique nanoparticle-oligonucleotide conjugates, the conjugates produced by the methods, and methods of using the conjugates. In addition, the invention provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 37 OF 41 USPATFULL on STN

AN 2002:168347 USPATFULL

TI **Nanoparticles** having **oligonucleotides** attached thereto and uses therefor

IN Mirkin, Chad A., Wilmette, IL, United States  
Letsinger, Robert L., Wilmette, IL, United States  
Mucic, Robert C., Glendale, CA, United States  
Storhoff, James J., Evanston, IL, United States  
Elghanian, Robert, Chicago, IL, United States

PA Nanosphere, Inc., Northbrook, IL, United States (U.S. corporation)

PI US 6417340 B1 20020709

AI US 2000-693352 20001020 (9)

RLI Division of Ser. No. US 1999-344667, filed on 25 Jun 1999  
Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999,  
now abandoned Continuation-in-part of Ser. No. WO 1997-US12783, filed on  
21 Jul 1997

PRAI US 1996-31809P 19960729 (60)

DT Utility

FS GRANTED

EXNAM Primary Examiner: Riley, Jezia

LREP McDonnell Boehnen Hulbert & Berghoff

CLMN Number of Claims: 10

ECL Exemplary Claim: 1

DRWN 58 Drawing Figure(s); 34 Drawing Page(s)

LN.CNT 4214

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have **sequences complementary** to portions of the **sequence** of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further

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provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing the nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 38 OF 41 USPATFULL on STN  
AN 2002:63683 USPATFULL  
TI **Nanoparticles** having **oligonucleotides** attached thereto and uses therefor  
IN Mirkin, Chad A., Wilmette, IL, United States  
Letsinger, Robert L., Wilmette, IL, United States  
Mucic, Robert C., Glendale, CA, United States  
Storhoff, James J., Evanston, IL, United States  
Elghanian, Robert, Chicago, IL, United States  
PA Nanosphere, Inc., Northbrook, IL, United States (U.S. corporation)  
PI US 6361944 B1 20020326  
AI US 1999-344667 19990625 (9)  
RLI Continuation-in-part of Ser. No. US 1999-240755, filed on 29 Jan 1999  
Continuation-in-part of Ser. No. WO 1997-US12783, filed on 21 Jul 1997  
PRAI US 1996-31809P 19960729 (60)  
DT Utility  
FS GRANTED  
EXNAM Primary Examiner: Riley, Jezia  
LREP McDonnell Boehnen Hulbert & Berghoff  
CLMN Number of Claims: 12  
ECL Exemplary Claim: 1  
DRWN 58 Drawing Figure(s); 34 Drawing Page(s)  
LN.CNT 4158

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention provides methods of detecting a nucleic acid. The methods comprise contacting the nucleic acid with one or more types of particles having oligonucleotides attached thereto. In one embodiment of the method, the **oligonucleotides** are attached to **nanoparticles** and have **sequences complementary** to portions of the **sequence** of the nucleic acid. A detectable change (preferably a color change) is brought about as a result of the **hybridization** of the **oligonucleotides** on the **nanoparticles** to the nucleic acid. The invention also provides compositions and kits comprising particles. The invention further provides nanomaterials and nanostructures comprising nanoparticles and methods of nanofabrication utilizing the nanoparticles. Finally, the invention provides a method of separating a selected nucleic acid from other nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 39 OF 41 USPATFULL on STN  
AN 2002:60923 USPATFULL  
TI Single-molecule selection methods and compositions therefrom  
IN Cubicciotti, Roger S., Montclair, NJ, UNITED STATES  
PI US 2002034757 A1 20020321  
AI US 2001-907385 A1 20010717 (9)  
RLI Continuation of Ser. No. US 1998-81930, filed on 20 May 1998, GRANTED, Pat. No. US 6287765  
DT Utility  
FS APPLICATION  
LREP LICATA & TYRRELL P.C., 66 E. MAIN STREET, MARLTON, NJ, 08053  
CLMN Number of Claims: 129  
ECL Exemplary Claim: 1  
DRWN No Drawings

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LN.CNT 15716

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Single-molecule selection methods are provided for identifying target-binding molecules from diverse sequence and shape libraries. Complexes and imprints of selected target-binding molecules are also provided. The subject selection methods are used to identify oligonucleotide and nonnucleotide molecules with desirable properties for use in pharmaceuticals, drug discovery, drug delivery, diagnostics, medical devices, cosmetics, agriculture, environmental remediation, smart materials, packaging, microelectronics and nanofabrication. Single oligonucleotide molecules with desirable binding properties are selected from diverse sequence libraries and identified by amplification and sequencing. Alternatively, selected oligonucleotide molecules are identified by sequencing without amplification. Nonnucleotide molecules with desirable properties are identified by single-molecule selection from libraries of conjugated molecules or nucleotide-encoded nonnucleotide molecules. Alternatively, target-specific nonnucleotide molecules are prepared by imprinting selected oligonucleotide molecules into nonnucleotide molecular media. Complexes and imprints of molecules identified by single-molecule selection are shown to have broad utility as drugs, prodrugs, drug delivery systems, willfully reversible cosmetics, diagnostic reagents, sensors, transducers, actuators, adhesives, adherents and novel multimolecular devices.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 40 OF 41 USPATFULL on STN

AN 2001:152673 USPATFULL

TI Methods for detecting and identifying single molecules

IN Cubicciotti, Roger S., Montclair, NJ, United States

PA Molecular Machines, Inc., Montclair, NJ, United States (U.S. corporation)

PI US 6287765 B1 20010911

AI US 1998-81930 19980520 (9)

DT Utility

FS GRANTED

EXNAM Primary Examiner: Fredman, Jeffrey

LREP Licata & Tyrrell P.C.

CLMN Number of Claims: 27

ECL Exemplary Claim: 1

DRWN No Drawings

LN.CNT 15456

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Multimolecular devices and drug delivery systems prepared from synthetic heteropolymers, heteropolymeric discrete structures, multivalent heteropolymeric hybrid structures, aptameric multimolecular devices, multivalent imprints, tethered specific recognition devices, paired specific recognition devices, nonaptameric multimolecular devices and immobilized multimolecular structures are provided, including molecular adsorbents and multimolecular adherents, adhesives, transducers, switches, sensors and delivery systems. Methods for selecting single synthetic nucleotides, shape-specific **probes** and specifically attractive surfaces for use in these multimolecular devices are also provided. In addition, paired nucleotide-nonnucleotide mapping libraries for transposition of selected populations of selected nonoligonucleotide molecules into selected populations of replicatable nucleotide sequences are described.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 41 OF 41 USPATFULL on STN

AN 1998:1622 USPATFULL



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TI Peptide-based nucleic acid mimics (PENAMS)  
IN Shah, Vibhakar J., San Francisco, CA, United States  
Kenyon, George L., San Francisco, CA, United States  
Kuntz, Irwin D., Greenbrae, CA, United States  
PA The Regents of The University of California, Oakland, CA, United States  
(U.S. corporation)  
PI US 5705333 19980106  
AI US 1994-286875 19940805 (8)  
DT Utility  
FS Granted  
EXNAM Primary Examiner: Rories, Charles C.P.  
LREP Morrison & Foerster  
CLMN Number of Claims: 24  
ECL Exemplary Claim: 1  
DRWN 14 Drawing Figure(s); 14 Drawing Page(s)  
LN.CNT 3222

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention provides novel nucleic acid mimics (termed "PENAMS") comprising a peptidic backbone and nucleotidic sidechains; the sidechains being oriented in such a way that the PENAM is homomorphous to target nucleic acids with which it can effectively hydrogen bond. Homomorphism is achieved by the incorporation of unusual stereochemical centers, including D-chiral centers and quasi-chiral centers, into the peptidic backbone. The PENAMS are useful for targeting nucleic acid sequences in order to modulate their activity in an "antisense" manner. Targeting can also be used to detect, isolate or modify target nucleic acids.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

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(FILE 'HOME' ENTERED AT 16:29:43 ON 14 NOV 2003)

FILE 'BIOSIS, MEDLINE, CAPLUS, WPIDS, USPATFULL' ENTERED AT 16:30:14 ON 14 NOV 2003

L1 567 S NANOPARTICLE? (7A) OLIGONUCLEOTIDE?  
L2 236 S L1 AND REPORTER  
L3 226 S L2 AND PROBE?  
L4 0 S L3 AND HYBRIDAZTION  
L5 223 S L3 AND HYBRIDIZATION  
L6 211 DUP REM L5 (12 DUPLICATES REMOVED)  
L7 41 S L6 AND OLIGONUCLEOTIDE? (5A) REPORTER  
L8 41 S L7 AND SEQUENCE? (5A) COMPLEMENT?

=> s l8 and kit

L9 38 L8 AND KIT

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